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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,354	12/05/2003	Bjorn Hansson	9342-139	8255

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EXAMINER	
DAGOSTA, STEPHEN M	

ART UNIT	PAPER NUMBER
2683	

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/729,354	HANSSON ET AL.	
	Examiner	Art Unit	
	Stephen M. D'Agosta	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) *14-20* is/are withdrawn from consideration.

5)☒ Claim(s) *9-13* is/are allowed.

6)☒ Claim(s) *1-4 and 21-23, 30-34 and 38-42* is/are rejected.

7)☒ Claim(s) *5-8,24-29,35-37 and 43-45* is/are objected to.

8)☒ Claim(s) *14-20* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-13 and 21-45, drawn to GPS time assistance, classified in class 455, subclass 502.

II. Claims 14-20, drawn to location determination, classified in class 342, subclass 357.03, .06 and .07.

The examiner contacted the applicant's attorney, Robert Crouse, on August 24th, 2005 to discuss the Restriction. Mr. Crouse elected claims 1-13 and 21-45 to be examined. Therefore claims 14-20 have been cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 21-22, 31-34 and 39-42 rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao et al. US 6,429,811 and further in view of Dussell et al. US 5,938,721 and McClennon et al. US 6,324,170.

As per **claims 1, 21, 31 and 39,** Zhao teaches a method/server of providing Global Positioning System (GPS) time assistance to a mobile station (title, abstract) comprising:

transmitting a message from a networked GPS time server to a mobile station, the message including GPS referenced time information (C4, L52 to C5, L5 teaches GPS receiver generating GPS assistance messages); and

transmitting the message to the mobile station (C4, L57-63 teaches the GPS receiver, figure 2, #260, sending messages to the mobile device),

but is silent on indicating an elapsed GPS referenced time interval at the networked GPS time server between receiving a request for GPS time assistance at the networked GPS time server.

Zhao does teach correcting for clock inconsistencies (C5, L28-24) as well as correcting for the time it takes for messages to travel to/from mobile/GPS receiver (C8, L23-41 which discloses accounting for the distance between mobile and GPS receiver, "...the separation distance D between the BTS and mobile is very short" and "..the calculated maximum erro in the measured range based on the ....10km separation distance D..."). Hence, Zhao will correct for any elapsed time it takes a message to travel between the mobile and GPS reference station (eg. for a request and/or an assistance message).

Dussell teaches a GPS request message from a mobile device to a GPS server "Second, the GPS data can be provided at a central server, and any device (such as mobile computer system 20) requiring such data can address a data request to the GPS server. The server then packages the requested data in a packet, frame or other suitable format and sends the packaged data directly to the requesting device" (C5, L53-67)

Further, McClennon teaches an echo controller that compensates for variable delay (title) whereby an estimation is made of the roundtrip delay (RTD) whereby timestamps can be used in packet data communications using ICMP messages (abstract and C2, L4-15).

The examiner notes that mobile devices with IP connectivity are well known and therefore ICMP would be supported on these devices as well.

With further regard to claim 31, Zhao **is silent on** and an IP stack including an ICMP compliant protocol layer configured to request GPS referenced time information from the GPS time source responsive to ICMP time stamp request messages and configured to transmit ICMP time reply messages including the GPS referenced time information. McClennon teaches use of ICMP messages to transmit data to/from devices which inherently requires the IP stack with an ICMP compliant protocol layer. The ICMP messages would be used to transmit GPS time information as per Zhao and Dussell.

It would have been obvious to one skilled in the art at the time of the invention to modify Zhao, such that indicating an elapsed GPS referenced time interval at the networked GPS time server between receiving a request for GPS time assistance at the networked GPS time server, to provide means for the mobile to subtract out the elapsed time for roundtrip transmission and reception of the request and subsequent data.

As per **claims 2, 22 and 40,** Zhao teaches claim 1/21/39 **but is silent on** wherein the message comprises an Internet Control Message Protocol message.

McClennon teaches an echo controller that compensates for variable delay (title) whereby an estimation is made of the roundtrip delay (RTD) whereby timestamps can be used in packet data communications using ICMP messages (abstract).

It would have been obvious to one skilled in the art at the time of the invention to modify Zhao, such that the message comprises an Internet Control Message Protocol message, to provide support for industry standard protocols and their messages.

As per **claims 3 and 41,** Zhao teaches claim 1/39 **but is silent on** wherein the GPS referenced time information comprises a first GPS referenced time at which the networked GPS time server received the request and a second GPS referenced time at which the networked GPS time server transmitted the message.

Zhao does teach correcting for clock inconsistencies (C5, L28-24) as well as correcting for the time it takes for messages to travel to/from mobile/GPS receiver (C8, L23-41 which discloses accounting for the distance between mobile and GPS receiver, "...the separation distance D between the BTS and mobile is very short" and "..the calculated maximum erro in the measured range based on the ....10km separation distance D..."). Hence, Zhao will correct for any elapsed time it takes a message to travel between the mobile and GPS reference station (eg. for a request and/or an assistance message).

McClennon teaches an echo controller that compensates for variable delay (title) whereby an estimation is made of the roundtrip delay (RTD) whereby timestamps can be used in packet data communications using ICMP messages (abstract and C2, L4-15).

It would have been obvious to one skilled in the art at the time of the invention to modify Zhao, such that the GPS referenced time information comprises a first GPS referenced time at which the networked GPS time server received the request and a second GPS referenced time at which the networked GPS time server transmitted the message, to provide means for subtracting out the elapsed time for the transmission of the request sent and the data received.

As per **claim 4,** Zhao teaches claim 3 **but is silent on** wherein the GPS referenced time information further comprises: a mobile station referenced request time at which the mobile station transmitted the request to the networked GPS time server.

McClennon teaches an echo controller that compensates for variable delay (title) whereby an estimation is made of the roundtrip delay (RTD) whereby timestamps can be used in packet data communications using ICMP messages (abstract and C2, L4-15). The examiner notes that in order for the RTD to be calculated, McClennon needs to known when the message was sent, received at an interim location and then sent back to the sender.

It would have been obvious to one skilled in the art at the time of the invention to modify Zhao, such that the GPS referenced time information further comprises: a mobile station referenced request time at which the mobile station transmitted the request to the networked GPS time server, to provide means for knowing when the mobile transmitted the message to subtract out elapsed transmission times for request/data messages.

As per **claim 32,** Zhao teaches claim 31 **but is silent on** wherein the GPS referenced time information comprises: a first GPS referenced time associated with when the ICMP time request message was received by the networked server; and a second GPS referenced time associated with when the ICMP time replay message is transmitted by the networked server.

Zhao does teach correcting for clock inconsistencies (C5, L28-24) as well as correcting for the time it takes for messages to travel to/from mobile/GPS receiver (C8, L23-41 which discloses accounting for the distance between mobile and GPS receiver, "...the separation distance D between the BTS and mobile is very short" and "..the calculated maximum erro in the measured range based on the ....10km separation distance D..."). Hence, Zhao will correct for any elapsed time it takes a message to travel between the mobile and GPS reference station (eg. for a request and/or an assistance message).

McClennon teaches an echo controller that compensates for variable delay (title) whereby an estimation is made of the roundtrip delay (RTD) whereby timestamps can be used in packet data communications using ICMP messages (abstract and C2, L4-15).

It would have been obvious to one skilled in the art at the time of the invention to modify Zhao, such that the GPS referenced time information comprises: a first GPS referenced time associated with when the ICMP time request message was received by the networked server; and a second GPS referenced time associated with when the ICMP time replay message is transmitted by the networked server, to provide means for determining elapsed transmission time between when the message was sent, received and then when the data reply was sent/received.

As per **claim 33,** Zhao teaches claim 31 further comprising: an application layer of the IP stack; and an application configured to receive the GPS time assistance requests from mobile stations and configured to provide GPS time assistance information in response thereto, wherein the application is configured to access the ICMP compliant protocol layer through the application layer of the IP stack (Zhao teaches a GPS Receiver, figure 2 #260, which sends data to the mobile by using computer software/applications to calculate the GPS assistance data (abstract, C4, L52 to C5, L5).

As per **claim 34,** Zhao teaches claim 31 **but is silent on** further comprising: a GPS time source switch coupled between the IP stack and the GPS time source, wherein the GPS time source switch is configured to direct requests for GPS referenced time information to the GPS time source and direct GPS referenced time information from the GPS time source to the IP stack and configured to direct requests for server time information to a server time source and direct server referenced time information from the server time source to the IP stack.

Zhao does teach correcting for clock inconsistencies (C5, L28-24) as well as correcting for the time it takes for messages to travel to/from mobile/GPS receiver (C8, L23-41 which discloses accounting for the distance between mobile and GPS receiver,

"...the separation distance D between the BTS and mobile is very short" and "..the calculated maximum erro in the measured range based on the ....10km separation distance D..."). Hence, Zhao will correct for any elapsed time it takes a message to travel between the mobile and GPS reference station (eg. for a request and/or an assistance message).

Dussell teaches a GPS request message from a mobile device to a GPS server "Second, the GPS data can be provided at a central server, and any device (such as mobile computer system 20) requiring such data can address a data request to the GPS server. The server then packages the requested data in a packet, frame or other suitable format and sends the packaged data directly to the requesting device" (C5, L53-67)

Further, McClennon teaches an echo controller that compensates for variable delay (title) whereby an estimation is made of the roundtrip delay (RTD) whereby timestamps can be used in packet data communications using ICMP messages (abstract and C2, L4-15).

The examiner notes that mobile devices with IP connectivity are well known and therefore ICMP would be supported on these devices as well.

McClennon also teaches use of ICMP messages to transmit data to/from devices which inherently requires the IP stack with an ICMP compliant protocol layer. The ICMP messages would be used to transmit GPS time information as per Zhao and Dussell via an application "switch" or port/socket which receives the messages and routes them to the GPS time application for processing and subsequent transmission of GPS assistance data to the mobile.

It would have been obvious to one skilled in the art at the time of the invention to modify Zhao, such that there is a GPS time source switch coupled between the IP stack and the GPS time source, wherein the GPS time source switch is configured to direct requests for GPS referenced time information to the GPS time source and direct GPS referenced time information from the GPS time source to the IP stack and configured to direct requests for server time information to a server time source and direct server referenced time information from the server time source to the IP stack, to provide means for an application to provide the GPS time information to a mobile device whereby received mobile messages are fed/switched to the application for processing.

As per **claim 38,** Zhao teaches claim 31 and a computer-readable medium having computer-executable instructions for implementing the networked server (figure 2, #260 is the GPS receiver which processes and generates GPS time assistance information and inherently requires a processor and software/instructions to perform said processing).

As per **claim 42,** Zhao teaches claim claim 39 and a computer-readable medium having computer-executable instructions for performing the steps (figure 2, #260 is the GPS receiver which processes and generates GPS time assistance information and inherently requires a processor and software/instructions to perform said processing).

Claims 23 and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao/Dussel/McClennon and further in view of Postel, ICMP Protocol Specification, dated 1981.

As per **claim 23,** Zhao teaches claim 21 **but is silent on** wherein the request for GPS time assistance comprises an ICMP time request message and the message comprises an ICMP time response message.

McClennon teaches an echo controller that compensates for variable delay (title) whereby an estimation is made of the roundtrip delay (RTD) whereby timestamps can be used in packet data communications using ICMP messages (abstract and C2, L4-15). The examiner notes that in order for the RTD to be calculated, McClennon needs to known when the message was sent, received at an interim location and then sent back to the sender.

Postel teaches time-related messages such as Timestamp and Timestamp Reply, which reads on the claim (on the printed document, see page 11).

It would have been obvious to one skilled in the art at the time of the invention to modify Zhao, such that the request for GPS time assistance comprises an ICMP time request message and the message comprises an ICMP time response message, to provide means for "time-stamping" messages and/or having the capability to know when a message was sent and received.

As per **claim 30,** Zhao teaches claim 22 **but is silent on** wherein the ICMP message comprises a PING message.

McClennon teaches an echo controller that compensates for variable delay (title) whereby an estimation is made of the roundtrip delay (RTD) whereby timestamps can be used in packet data communications using ICMP messages (abstract and C2, L4-15). The examiner notes that in order for the RTD to be calculated, McClennon needs to known when the message was sent, received at an interim location and then sent back to the sender.

Postel teaches several different messages including the Echo and Echo reply. The PING message is a well known message supported in wired/wireless networks and provide means to determine if a route/device is available.

It would have been obvious to one skilled in the art at the time of the invention to modify Zhao, such that the ICMP message comprises a PING message, to provide support for well known industry standard protocols, messages and functions.

Allowable Subject Matter

1. **Claims 9-13 allowed**. The prior art of record, alone or in combination, fails to disclose:

A method of providing Global Positioning System (GPS) time assistance to a mobile station comprising:

transmitting a request for GPS time assistance information from a mobile station to a networked GPS time server at a first mobile station referenced time;

receiving the request for GPS time assistance information at the networked GPS time server at a first GPS referenced time;

transmitting a single ICMP message from the networked GPS time server to the mobile station at a second GPS referenced time, the single ICMP message including at least the first and second GPS referenced times;

receiving the single ICMP message at the mobile station at a second mobile station referenced time; and

determining a current GPS referenced time at the mobile station based on the first and second GPS referenced times and the first and second mobile station referenced times.

2. **Claims 5-8, 24-29, 35-37 and 43-45** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As per **claim 5,** the prior art of record fails to disclose "wherein the message comprises a single ICMP message including the first and second GPS referenced times and the mobile station request time".

As per **claim 6,** the prior art of record fails to disclose "receiving the message at the mobile station at a mobile station referenced reception time at which the mobile station received the message from the networked GPS time server; determining a delay associated with propagation of the message from the networked GPS time server to the mobile station based on the mobile station referenced reception time and the mobile station referenced request time; and determining a mobile station GPS time based on the second GPS referenced time at which the networked GPS time server transmitted the message and the delay".

As per **claim 7** – depends from claim 6.

As per **claim 8,** the prior art of record fails to disclose "transmitting is preceded by: accessing GPS referenced time from the networked GPS time server responsive to the request to provide a first GPS referenced time at the networked GPS time server when the message is received; and accessing GPS referenced time from the networked GPS time server responsive to the request to provide a second GPS referenced time at the networked GPS time server when the message is transmitted".

As per **claim 24,** the prior art of record fails to disclose "wherein GPS referenced time information comprises GPS Time-Of-Week (TOW) information and GPS sub-frame information indicating GPS time having a greater accuracy than the GPS TOW information alone".

As per **claim 25,** the prior art of record fails to disclose "wherein the GPS referenced time information further comprises: GPS data bit count information indicating a bit position within the GPS sub-frame information indicating GPS time having a greater accuracy than the GPS TOW information and the GPS sub-frame information alone".

As per **claim 26,** the prior art of record fails to disclose "wherein the GPS referenced time information further comprises: coarse acquisition code information indicating a coarse acquisition code repetition count within the GPS data bit count information indicating GPS time having a greater accuracy than the GPS TOW information, the GPS sub-frame information, and the GPS data bit count information alone".

As per **claim 27,** the prior art of record fails to disclose "wherein the GPS referenced time information comprises: GPS Time-Of-Week (TOW) information; and four bits of GPS sub-frame information indicating a word position within a frame of the GPS TOW information; five bits of GPS data bit count information indicating a bit position within the GPS sub-frame information; and coarse acquisition code information indicating a coarse acquisition code repetition count within the GPS data bit count information".

As per **claim 28,** the prior art of record fails to disclose "wherein the GPS TOW information is separated into at least two ICMP messages, or excludes at least some of the most significant bits of the GPS TOW information".

As per **claim 29,** the prior art of record fails to disclose "wherein the coarse acquisition code information comprises between one and five bits inclusive".

As per **claim 35,** the prior art of record fails to disclose "claim 31 wherein GPS referenced time information comprises GPS Time-Of-Week (TOW) information and GPS sub-frame information indicating GPS time having a greater accuracy than the GPS TOW information alone".

As per **claim 36,** the prior art of record fails to disclose "wherein the GPS referenced time information further comprises: GPS data bit count information indicating a bit position within the GPS sub-frame information indicating GPS time having a greater accuracy than the GPS TOW information and the GPS sub-frame information alone".

As per **claim 37,** the prior art of record fails to disclose "wherein the GPS referenced time information further comprises: coarse acquisition code information indicating a coarse acquisition code repetition count within the GPS data bit count information indicating GPS time having a greater accuracy than the GPS TOW information, the GPS sub-frame information, and the GPS data bit count information alone".

As per **claim 43,** the prior art of record fails to disclose "wherein the GPS referenced time information comprises GPS Time-Of-Week (TOW) information and GPS sub-frame information indicating GPS time having a greater accuracy than the GPS TOW information alone".

As per **claim 44,** the prior art of record fails to disclose "wherein the GPS referenced time information further comprises: GPS data bit count information indicating a bit position within the GPS sub-frame information indicating GPS time having a greater accuracy than the GPS TOW information and the GPS sub-frame information alone".

As per **claim 45,** the prior art of record fails to disclose "wherein the GPS referenced time information further comprises: coarse acquisition code information indicating a coarse acquisition code repetition count within the GPS data bit count information indicating GPS time having a greater accuracy than the GPS TOW information, the GPS sub-frame information, and the GPS data bit count information alone".

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. Havinis et al. US 6,295,454
2. Zadeh et al. US 6,266,533
3. Camp Jr. US 6,084,544
4. Vayanos et al. US 6,134,483

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 571-272-7862. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen D'Agosta
8-25-2005